

WHAT IS CLAIMED IS:

1. A collagen-binding physiologically active polypeptide having both collagen-binding activity and physiological activity different from fibronectin-activities including collagen-binding activity comprising:

a first peptide having collagen-binding activity and consisting of an amino acid sequence which is identical to an amino acid sequence of protease-hydrolysis fragment of fibronectin with at least one protease selected from a group consisting of trypsin, chymotrypsin, thermolysin, plasmin, thrombin, cathepsin D, cathepsin G, pepsin, subtilisin, leukocyte elastase and chymase, and which corresponds to an internal amino acid sequence in collagen-binding domain ranging from 28kDa to 75kDa from the amino-terminal of fibronectin,

fused with

a second peptide having physiological activity different from fibronectin activities including collagen-binding activity.

2. A collagen-binding physiologically active polypeptide according to claim 1 wherein said first peptide consists of an internal amino acid sequence of human fibronectin selected from a group consisting of

from Ala²⁶⁰ to Trp³⁹⁹ (Ala² to Trp³⁴¹ of SEQ ID NO.1),

from Ala²⁶⁰ to Leu⁴³³ (Ala² to Leu²²⁹ of SEQ ID NO.1),

from Ala²⁶⁰ to Arg⁴⁹⁴ (Ala² to Arg²²⁶ of SEQ ID NO.1),
 from Val²⁶² to Arg⁴⁹⁴ (Val⁴ to Arg²²⁶ of SEQ ID NO.1),
 from Val²⁶² to Trp⁵⁹⁹ (Val⁴ to Trp³⁴¹ of SEQ ID NO.1),
 from Val²⁷⁷ to Leu⁴⁹³ (Val¹¹⁹ to Leu²²⁵ of SEQ ID NO.1),
 from Val²⁷⁷ to Trp⁵⁹⁹ (Val¹¹⁹ to Trp³⁴¹ of SEQ ID NO.1),
 from Leu⁴⁹³ to Trp⁵⁹⁹ (Leu²²⁵ to Trp³⁴¹ of SEQ ID NO.1),
 from Arg⁴⁹⁴ to Trp⁵⁹⁹ (Arg²²⁶ to Trp³⁴¹ of SEQ ID NO.1).
 from Ala²⁶¹ to Phe⁵⁹⁴ (Ala³ to Phe³²⁶ of SEQ ID NO.1),
 from Ala²⁶¹ to Gln⁴⁹² (Ala³ to Gln²²⁴ of SEQ ID NO.1),
 from Arg⁴⁹⁴ to Phe⁵⁹⁴ (Arg²²⁶ to Phe³²⁶ of SEQ ID NO.1),
 from Val²⁶² to Phe⁵⁹⁴ (Val⁴ to Phe³²⁶ of SEQ ID NO.1),
 from Leu⁴⁹³ to Phe⁵⁹⁴ (Leu²²⁵ to Phe³²⁶ of SEQ ID NO.1),
 and from Asp⁴⁹⁵ to Trp⁵⁹⁹ (Asp²²⁷ to Trp³⁴¹ of SEQ ID NO.1).

3. A collagen-binding physiologically active polypeptide
 according to claim 1 wherein said protease-hydrolysis is a proteolysis
 with a combination of chymotrypsin and plasmin.

4. A collagen-binding physiologically active polypeptide
 according to claim 3 wherein the first peptide consists of an amino
 acid sequence of human fibronectin Ala²⁶⁰ to Trp⁵⁹⁹ (Ala² to Trp³⁴¹
 of SEQ ID NO.1).

5. A collagen-binding physiologically active polypeptide according to claim 1 wherein said protease-hydrolysis is a proteolysis with trypsin.

6. A collagen-binding physiologically active polypeptide according to claim 5 wherein the first peptide consists an amino acid sequence Ala²⁶⁰ to Arg⁴⁴⁴ (Ala² to Arg²²⁶ of SEQ ID NO.1).

7. A collagen-binding physiologically active polypeptide according to claim 1 wherein said protease-hydrolysis is a proteolysis with a combination of trypsin and chymotrypsin.

8. A collagen-binding physiologically active polypeptide according to claim 7 wherein the first peptide consists of an amino acid sequence Asp⁴⁵⁵ to Trp³⁹⁹ (Asp²²⁷ to Trp³⁴¹ of SEQ ID NO.1).

9. A collagen-binding physiologically active polypeptide according to claim 1 wherein said second peptide is a physiologically active peptide selected from a group consisting of a cytokine, insulin, parathyroid hormone and matrix metalloproteinases (MMPs).

10. A collagen-binding physiologically active polypeptide according to claim 1 wherein said second peptide is a cytokine.

11. A collagen-binding physiologically active polypeptide according to claim 10 wherein said cytokine is a growth factor.
12. A collagen-binding physiologically active polypeptide according to claim 1 wherein said second peptide is fused on the carboxyl terminal side of said first peptide.
13. A collagen-binding physiologically active polypeptide according to claim 12 wherein an amino acid spacer having less than 7 residues is inserted at the fusion site of the first peptide.
14. A collagen-binding physiologically active polypeptide according to claim 13 wherein a carboxyl terminal of said amino acid spacer is a proteolytic site.
15. A collagen-binding physiologically active polypeptide according to claim 1 wherein said collagen-binding activity is inhibited competitively by fibronectin.
16. A collagen-binding physiologically active polypeptide according to claim 1 wherein said polypeptide is produced in bacteria.
17. A collagen-binding physiologically active polypeptide according to claim 1 wherein said polypeptide is produced in a

transformant containing a recombinant vector including the gene coding for said collagen-binding physiologically active polypeptide.

18. An agent for enabling topical retention or sustained release of a physiologically active peptide or a physiological activity-imparting agent which contains the collagen-binding physiologically active polypeptide of claim 1.

19. A biomaterial comprising a composite wherein the collagen-binding physiologically active polypeptide of claim 1 is combined with collagen or gelatin.

20. An agent for enabling topical retention or sustained release of a physiologically active peptide or a physiological activity-imparting agent which contains the biomaterial of claim 19.